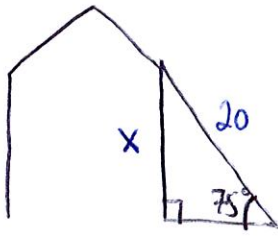


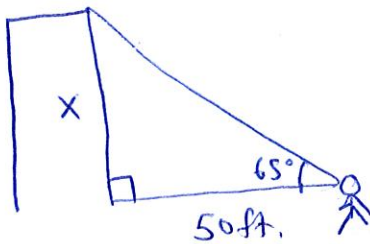
①



$$\sin 75^\circ = \frac{x}{20}$$

$$x = 19.3 \text{ ft.}$$

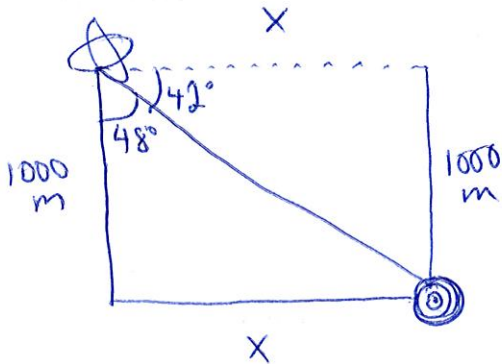
②



$$\tan 65^\circ = \frac{x}{50}$$

$$x = 107.2 \text{ ft.}$$

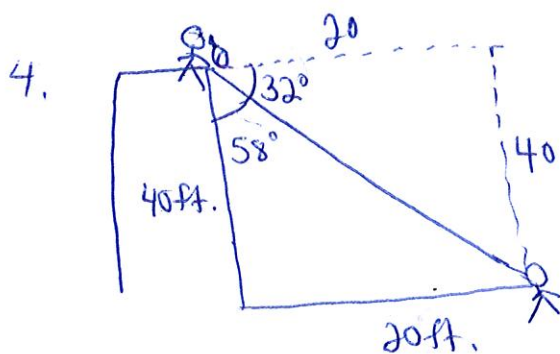
③



$$\tan 42^\circ = \frac{1000}{x}$$

$$\text{or } \tan 48^\circ = \frac{x}{1000}$$

$$x = 1,110.6 \text{ m}$$



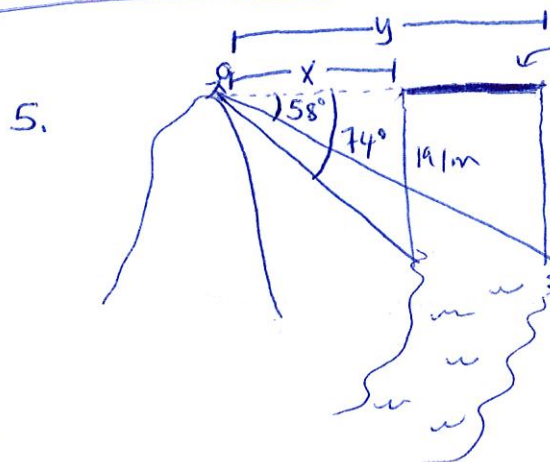
$$\tan 58^\circ = \frac{x}{40}$$

or $\tan 32^\circ = \frac{40}{x}$

$x = 64 \text{ ft.}$

(Not 20 feet...
it went WAY too far)

we'll call this side "x" - if we solve the equation and $x = 20$, then we know that the water balloon hit the girl \therefore .



This distance represents the width of the river.

$$\tan 58^\circ = \frac{191}{y}$$

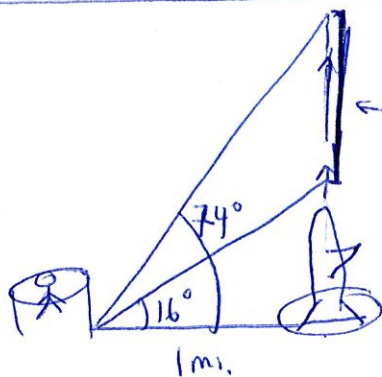
$$\tan 74^\circ = \frac{191}{x}$$

$$y = 119.35 \text{ m}$$

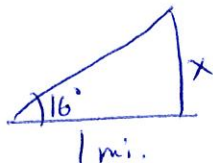
$$x = 54.77 \text{ m}$$

$$119.35 - 54.77 = 64.58 \text{ m}$$

6.

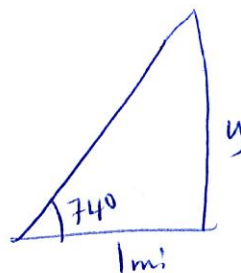


we want to know this distance



$$\tan 16^\circ = \frac{x}{1}$$

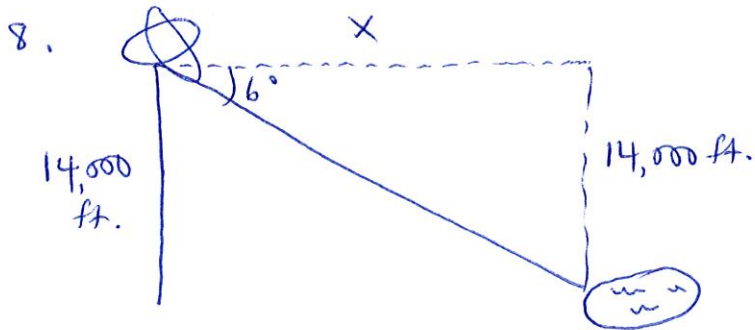
$$x = \frac{3.49}{0.2867} \text{ mi.}$$



$$\tan 74^\circ = \frac{y}{1}$$

$$y = 3.487 \text{ mi}$$

$$3.487 - 0.2867 = 3.2 \text{ miles}$$



$$\tan 6^\circ = \frac{14,000}{x}$$

$$x = 133,201.102 \text{ ft.}$$

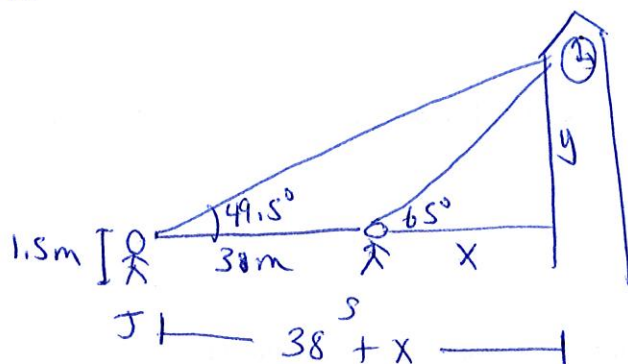
(5280 ft. in 1 mile)

$$133,201.102 \text{ ft.} = 25.227 \text{ mi.}$$

$$\frac{25.227 \text{ mi.}}{x \text{ min.}} = \frac{500 \text{ mi.}}{60 \text{ min.}}$$

$$x = 3.03 \text{ minutes}$$

9.



$$\tan 49.5^\circ = \frac{y}{38+x}$$

$$\tan 65^\circ = \frac{y}{x}$$

$$\tan 49.5^\circ = \frac{x(\tan 65^\circ)}{38+x}$$

$$x(\tan 65^\circ) = y$$

$$(38+x) 1.1708 = \left(\frac{2.1445x}{38+x} \right) (38+x)$$

$$1.1708x + 44.4904 = 2.1445x$$

$$44.4904 = 0.9737x$$

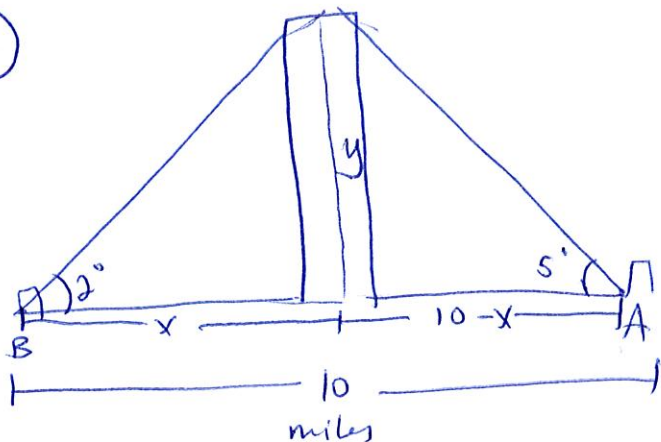
$$x = 45.692 \text{ m}$$

$$\tan 65^\circ = \frac{y}{45.692}$$

$$y = 98 \text{ m}$$

(Actually 96 m in real life)

10



$$\tan 2^\circ = \frac{y}{x}$$

$$y = x(\tan 2^\circ)$$

$$\tan 5^\circ = \frac{y}{10-x}$$

$$\tan 5^\circ = \frac{x(\tan 2^\circ)}{10-x}$$

$$(10-x)0.087489 = \left(\frac{0.03492x}{10-x} \right) (10-x)$$

$$-0.087489x + 0.87489 = 0.03492x$$

$$0.87489 = 0.12241x$$

$$\underline{\underline{x = 7.14722}}$$

$$\tan 2^\circ = \frac{y}{7.14722}$$

$$y = 0.249586 \text{ miles}$$

$$y = \textcircled{1,318 \text{ feet}}$$